

Wind Powering America Native American Activities

17 November 2004

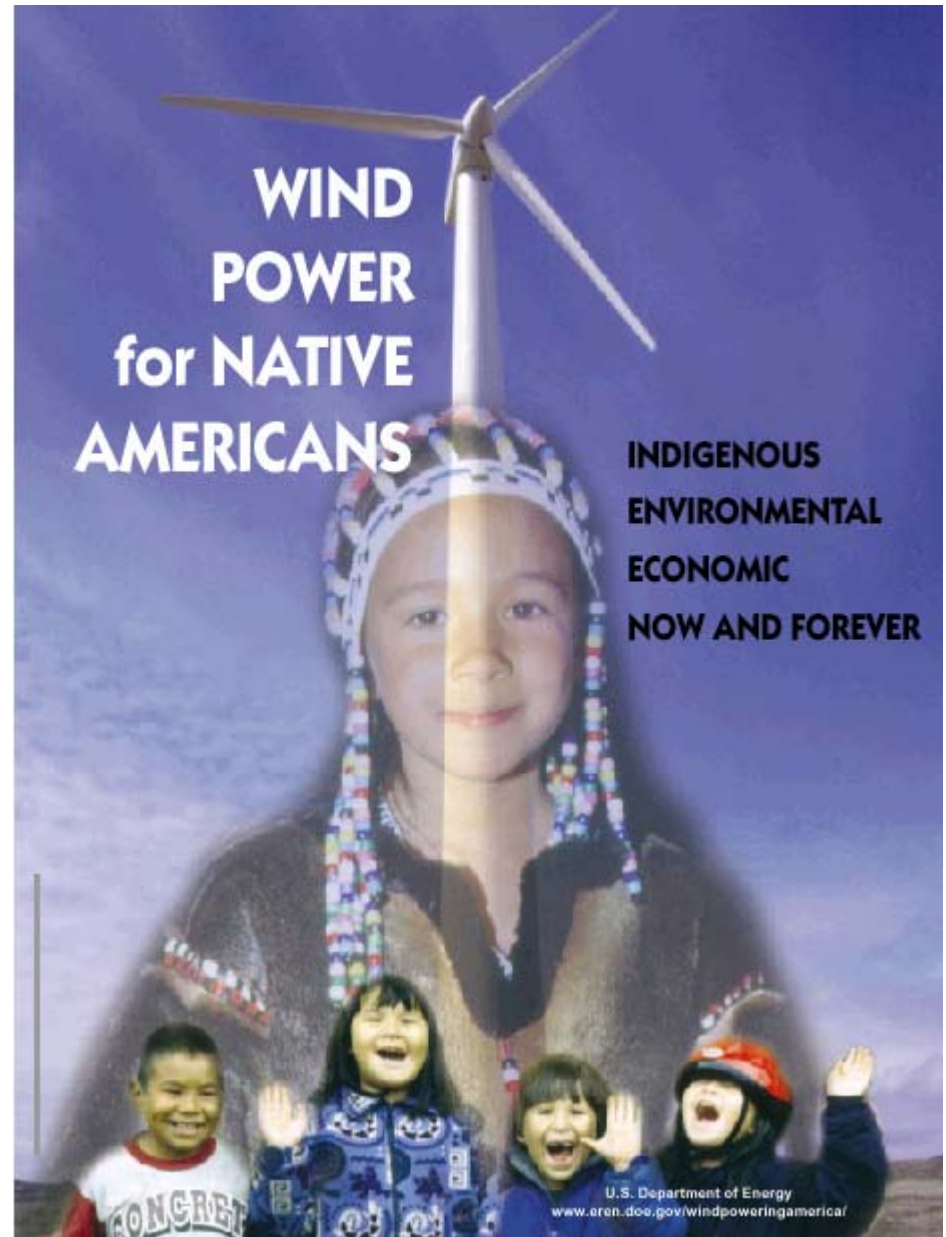
Tony Jimenez

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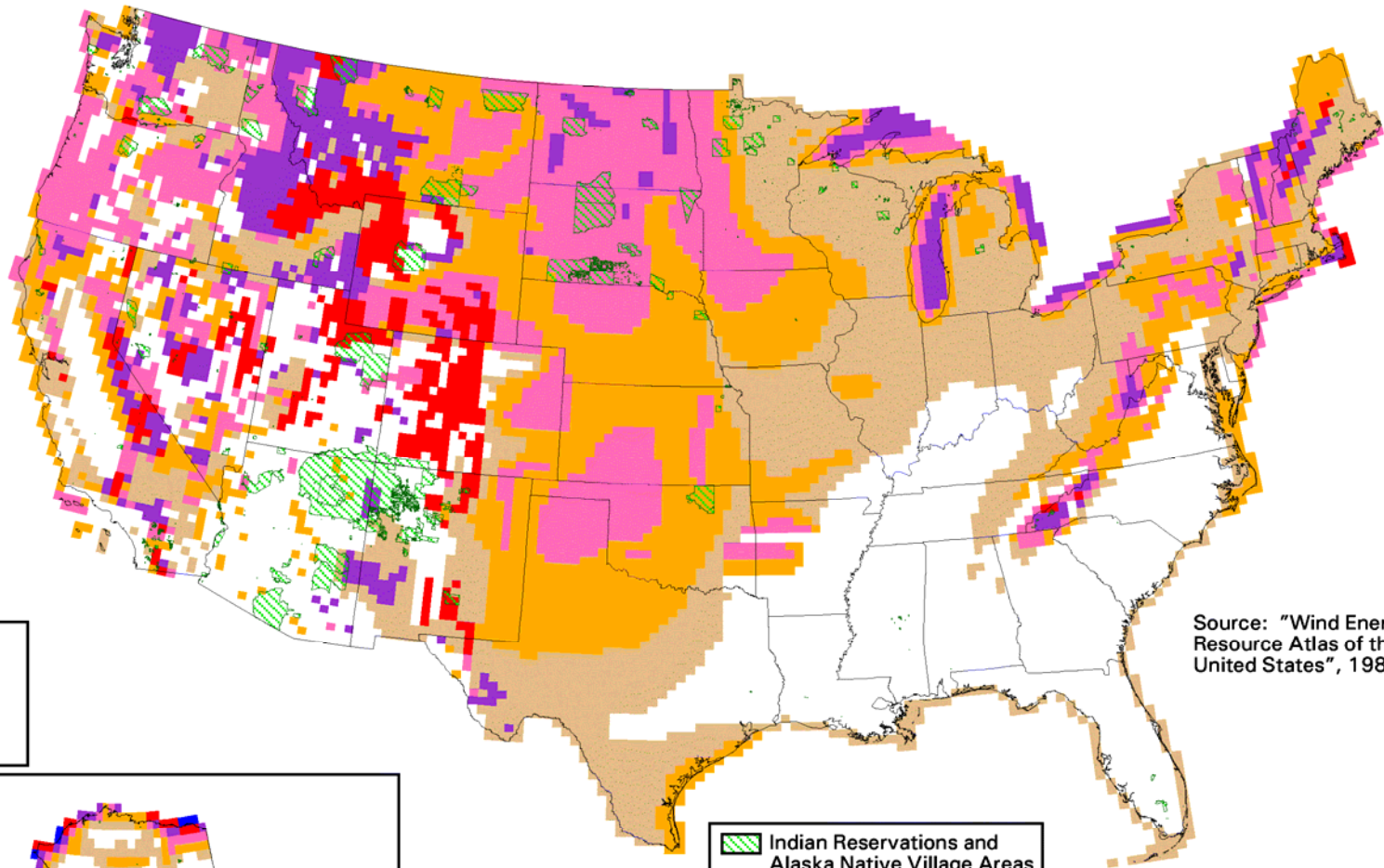
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Native American Activities

- Anemometer Loan Program
- Wind Energy Applications & Training Symposium (WEATS)
- Outreach
- Technical Assistance to DOE Tribal Energy Program



United States - Wind Resource Map



Source: "Wind Energy Resource Atlas of the United States", 1987

Wind Power Classification				
Wind Power Class	Resource Potential	Wind Power Density at 50 m W/m ²	Wind Speed ^a at 50 m m/s	Wind Speed ^a at 50 m mph
2	Marginal	200 - 300	5.6 - 6.4	12.5 - 14.3
3	Fair	300 - 400	6.4 - 7.0	14.3 - 15.7
4	Good	400 - 500	7.0 - 7.5	15.7 - 16.8
5	Excellent	500 - 600	7.5 - 8.0	16.8 - 17.9
6	Outstanding	600 - 800	8.0 - 8.8	17.9 - 19.7
7	Superb	800 - 1600	8.8 - 11.1	19.7 - 24.8

^a Wind speeds are based on a Weibull k value of 2.0

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Native American Wind Development

- NA wind resources
- On-site loads vs. export
- Investment vs. private developer royalties
- (perceived) Private sector development risk
- Tribal utility policies
- Federal load aggregation/trust responsibility
- Transmission constraints vs. green tags opportunity
- Tax advantages/limitations
- Hydro-wind firming
- NA Wind Interest Group

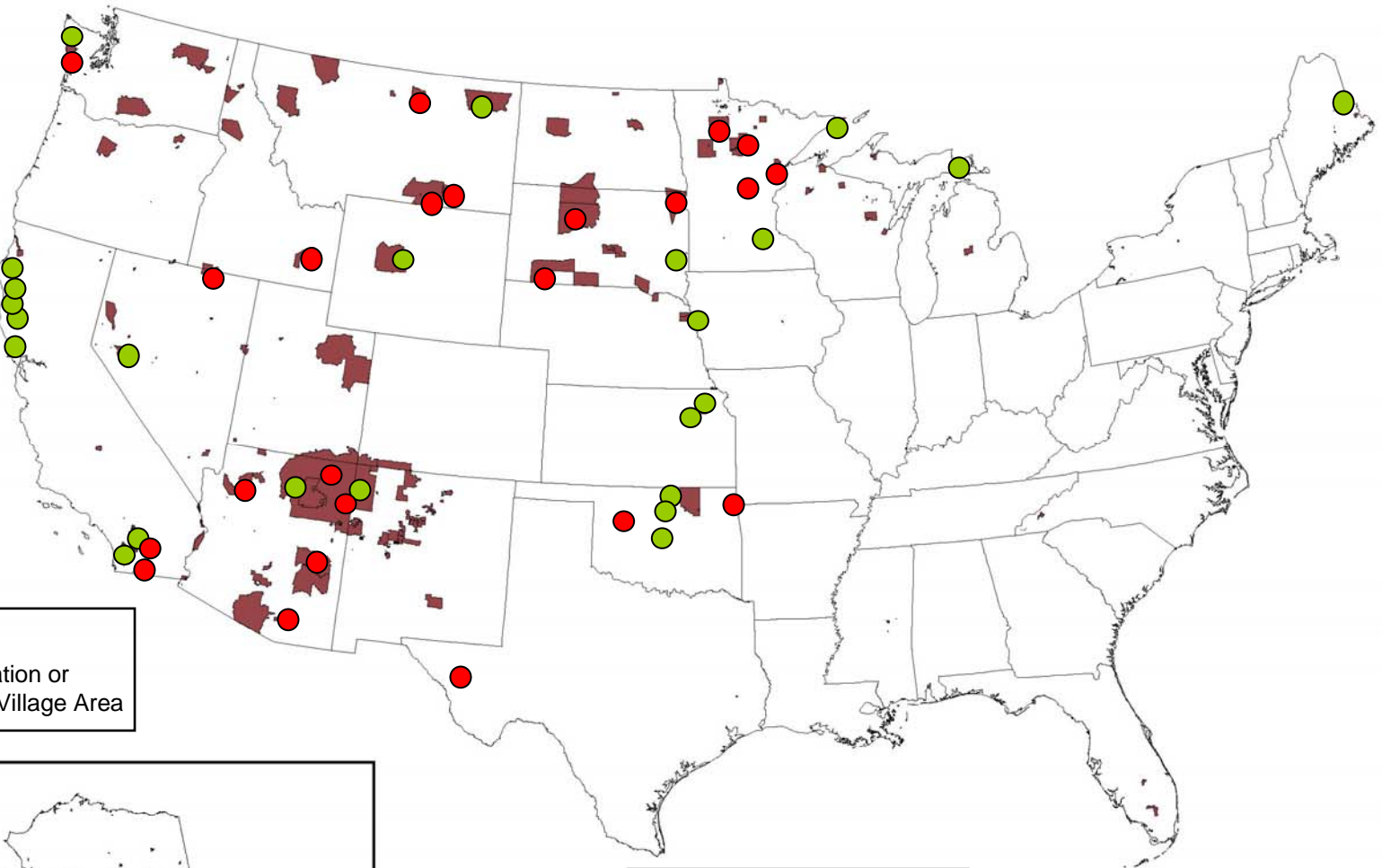


Anemometer Loan Program

- Lends 20 meter anemometers to tribes for wind prospecting
- Allows tribes to measure wind resource and provides means for NREL to engage with tribe
- NREL works with applicant to select suitable site
- Local experts under contract to NREL confirm site suitability & supervise anemometer installation
- NREL crunches the wind data and does final report.
- Tribes with suitable wind resource referred to TEP



NREL Anemometer Loan Program Sites

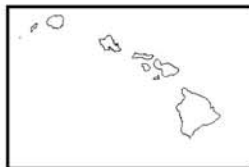
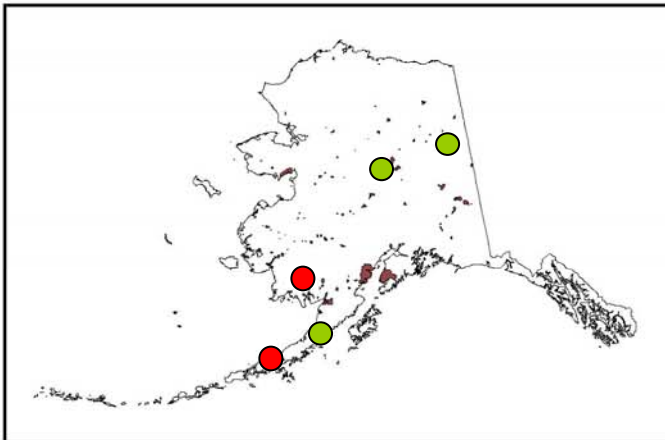


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Indian Reservation or
Alaska Native Village Area

Legend

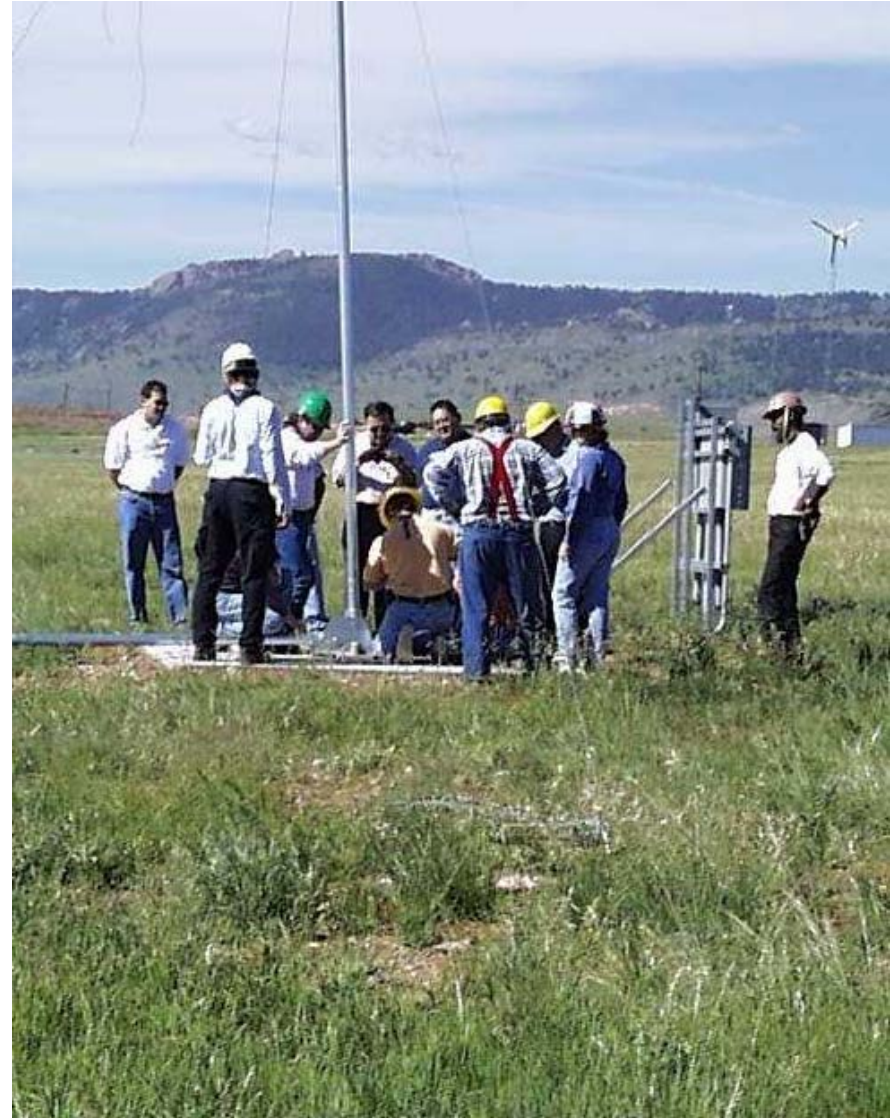
Monitoring Completed
Anemometer installed



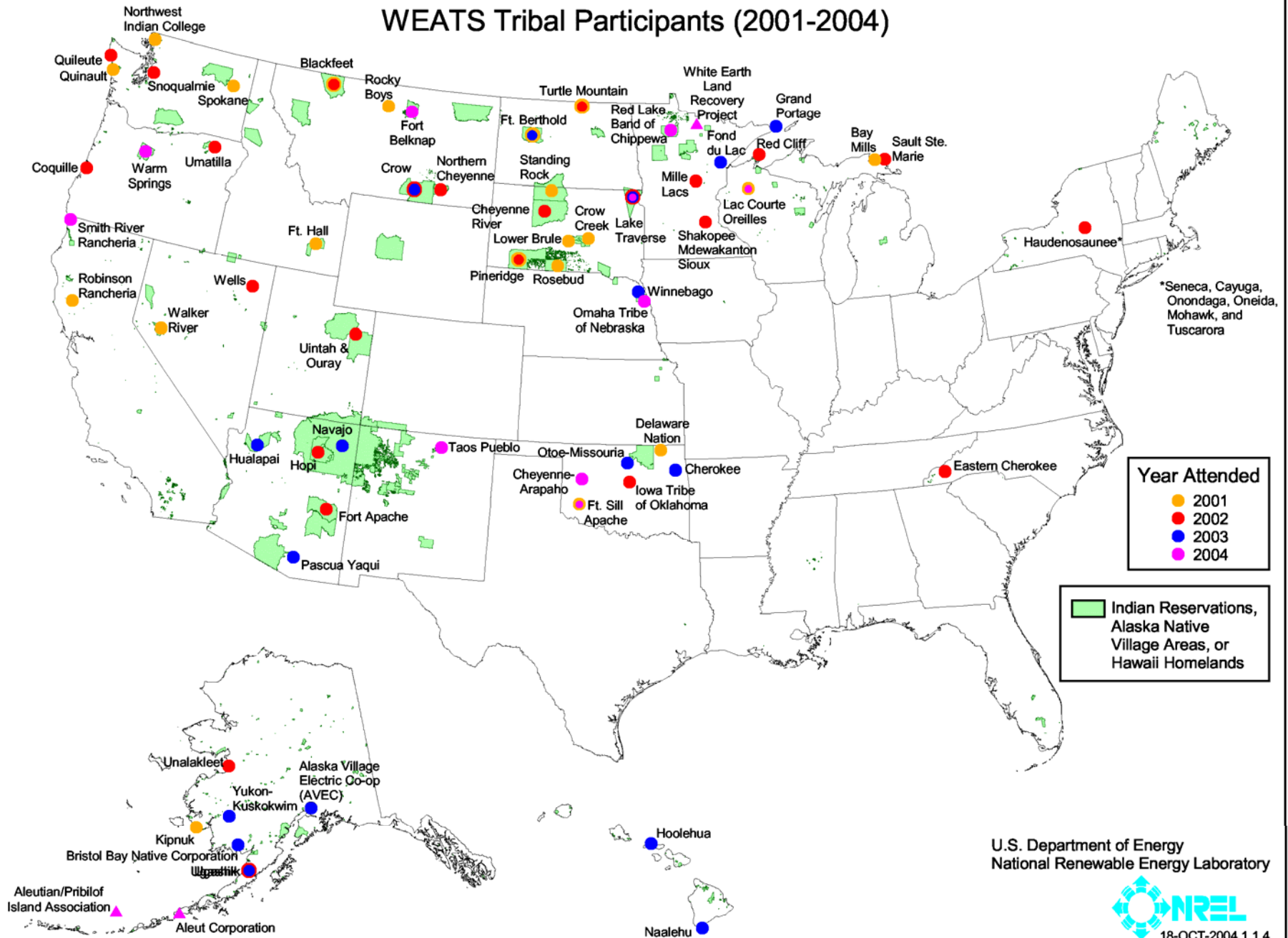
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- Annual NREL sponsored wind applications training course
- 15-25 NA attendees per year
- Content
 - Wind fundamentals
 - Resource assessment
 - Small wind technology & applications
 - Large wind project planning
 - Small wind / anemometer tower raising
 - Visit to local wind farm



WEATS Tribal Participants (2001-2004)



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Outreach Activities

- Presentations at conferences, meetings & workshops
- NAWIG Newsletter
- NA Wind Video
- Native American section in WPA web site

Wind & Hydropower Technologies Program
 Harnessing America's abundant natural resources for clean power generation



NAWIG NEWS
 THE QUARTERLY NEWSLETTER OF THE
 NATIVE AMERICAN WIND INTEREST GROUP
 SPRING 2004

As part of its Native American outreach, DOE's Wind Powering America program has initiated a quarterly NAWIG newsletter to present Native American wind information, including projects, interviews with pioneers, issues, WPA activities, and related events. It is our hope that this newsletter will both inform and elicit comments and input on wind development in Indian Country.

Wind Turbines Power Remote Navajo Homesteads

Some families on the Navajo Reservation are seeing things in a new light—a light powered by electricity from the wind.

Larry Ahasteen, renewable energy specialist for the Navajo Tribal Utility Authority (NTUA), and regional crews combine photovoltaic (PV) systems and small wind turbines to create hybrid systems that produce electricity for remote Navajo households.

"We use Mother Nature to generate power," Ahasteen said. "We want to use both the wind and the sun. The sun doesn't shine all the time."

It's estimated that 18,000 remote households on the Navajo Reservation do without electricity. The reservation spans 26,000 miles across three states, and the cost to extend the electrical grid averages about \$27,000 per mile. Some families use diesel generators and kerosene lamps to supply limited power. Families who apply for electrical service at the NTUA district office may be eligible to lease PV panels if the household is located too far from transmission lines. The hybrid PV/wind systems installed by the NTUA crews now provide another power option for these off-the-grid families.

The NTUA crews first experimented with PV systems combined with an LP gas generator, but they soon learned that the LP gas generator had high maintenance costs.

"Our customers need reliable systems, and wind turbines are the answer," Ahasteen said. "After consulting with wind and solar people, we developed a good hybrid system."

NTUA's hybrid system consists of eight solar panels in an 880-watt array, a 400-watt Air-X turbine, and four 6-volt, 770-amp-hour batteries in series to create a 24-VDC configuration. The system is modular; if the NTUA crews have to remove a system, they can easily do so and move it to a new location.



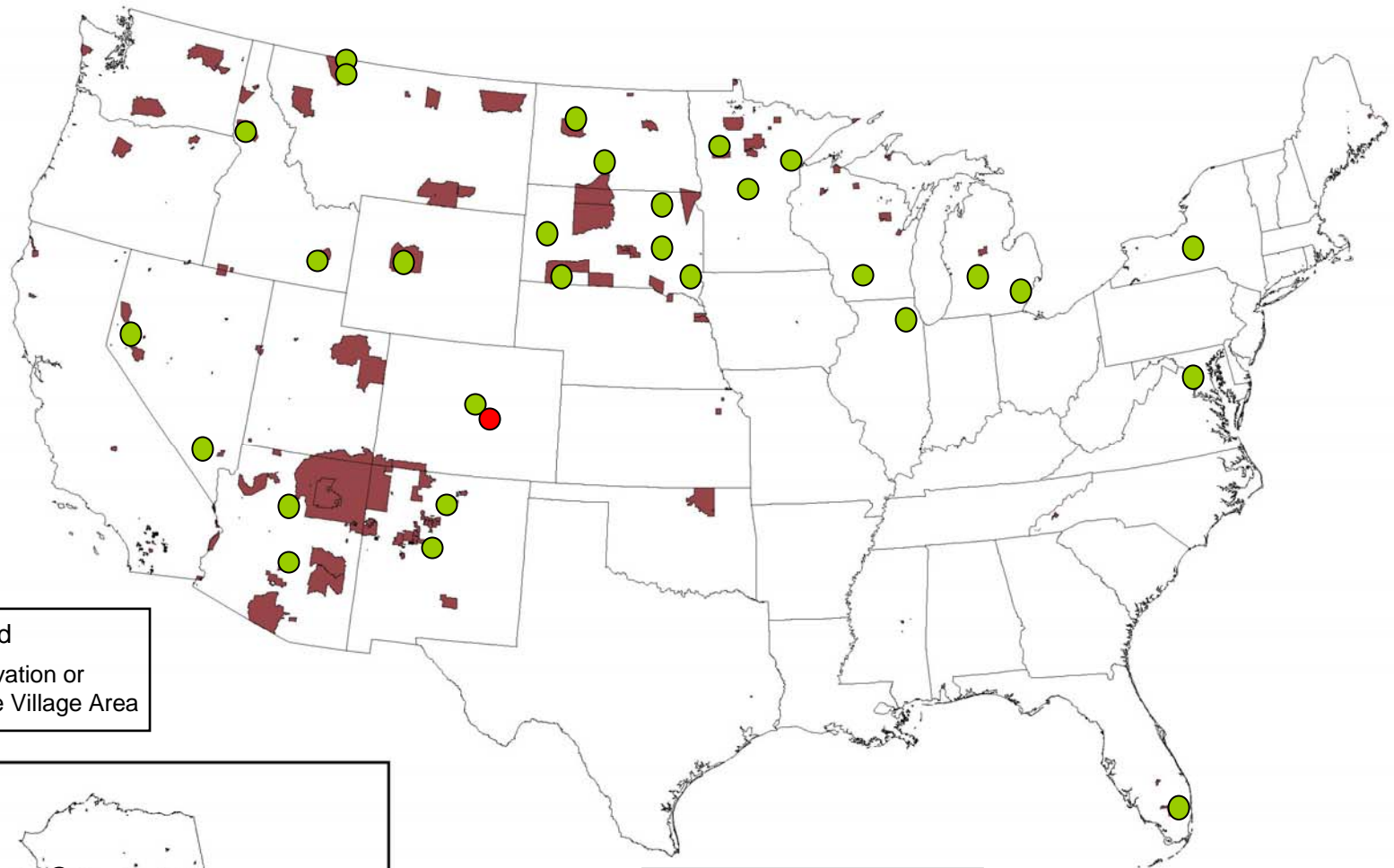
NTUA's technicians plan to install 63 hybrid systems this year to provide power for remote Navajo homesteads.

According to Ahasteen, they installed the first wind turbine with guy wires. They later revised their design and mounted turbines on utility poles, which made the turbines more secure and more efficient.

"We installed 40 PV units with wind turbines, and we thought it worked so well that this year we're adding 63 more units," he said.

— Story continued on page 2

WPA Outreach Activities



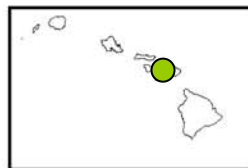
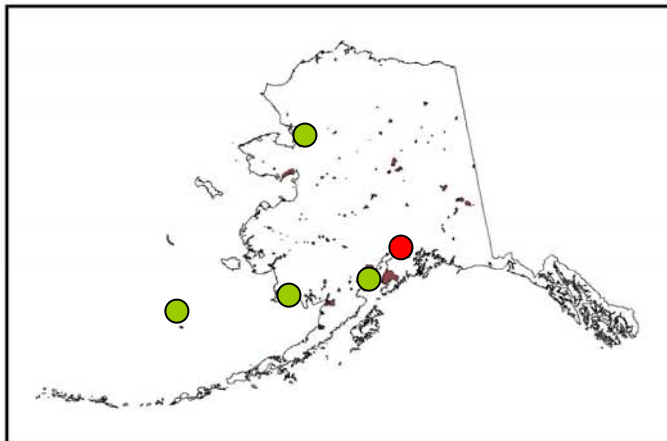
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● FY 2004
● FY 2005 (planned)

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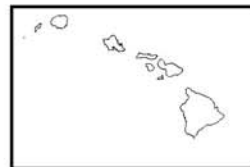
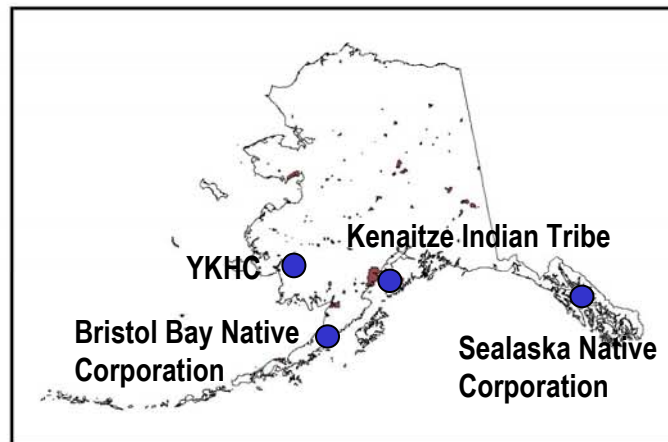
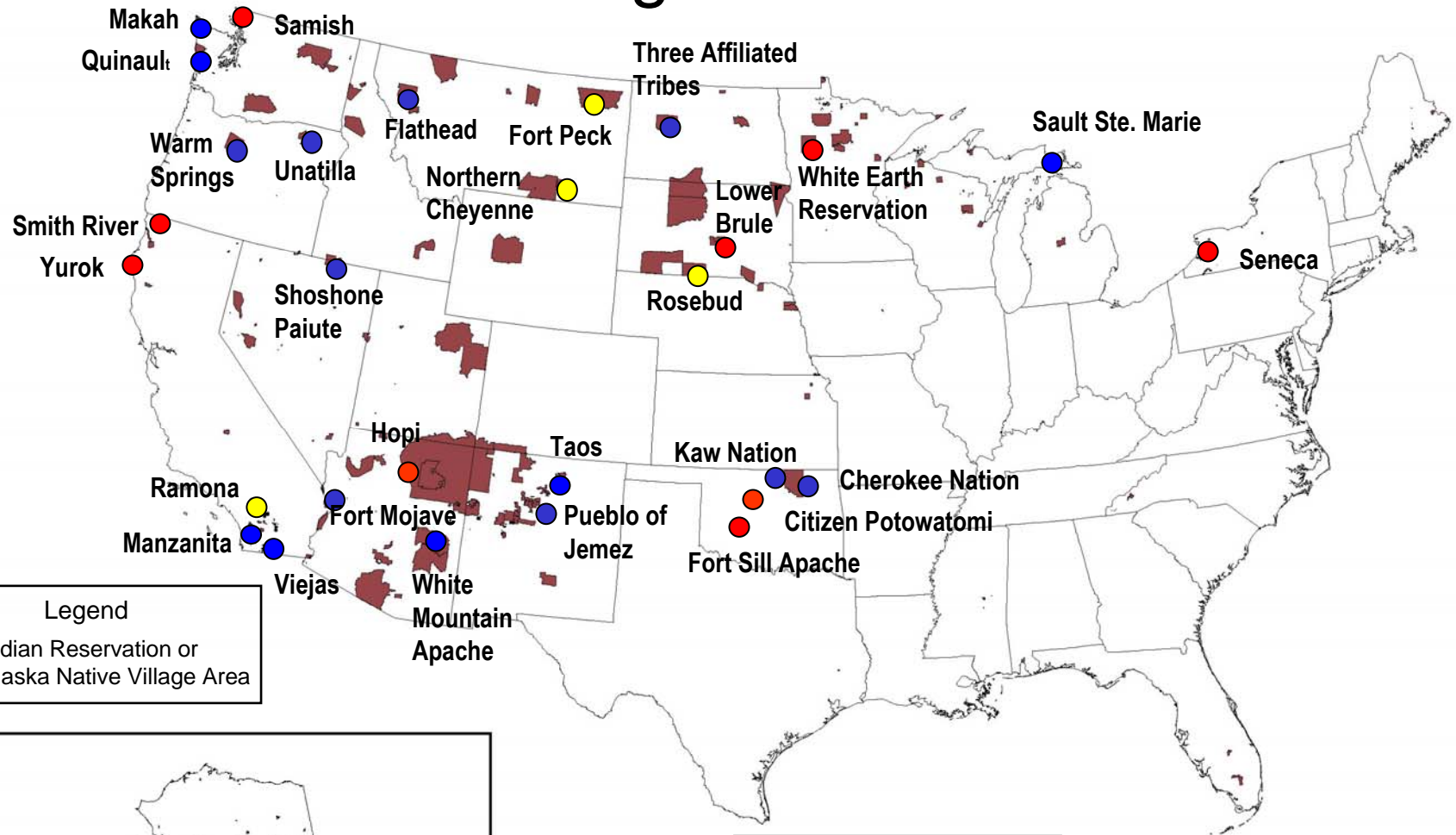


Technical Assistance to DOE Tribal Energy Program



- TEP is a separate DOE program that funds tribal renewable energy and energy efficiency projects
- Annual budget ~ \$5 million
- WPA Provides
 - Technical review of project proposals
 - Technical assistance to specific projects as requested

TEP Program Awards



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<http://www.eere.energy.gov/windpoweringamerica/>